CAD Drafting

Levels: Grades 10-12
Units of Credit: Minimum 0.5 credit
CIP Code: 15.1302
Prerequisite: Design & Drafting Technology

COURSE DESCRIPTION

Computer Aided Drafting (CAD) is simply a tool to complete a design or drafting problem as are drafting machines, triangles, scales, etc. We still use the same concept in design or production drawing. We still use orthographic drawings, sketching techniques, pictorials, sections, auxiliary views with dimensions, and ANSI Y14.5 standards.

STANDARD 151302-01 **The student will be able to use and care for computer hardware.**

OBJECTIVES

151302-0101 Have access to a computer that will handle CAD software.
- Demonstrate the proper care of equipment.
- Operate and adjust input-output devices (printers, plotters).
- Use correct procedures for the handling and operation of storage media.
- Use correct procedures for the startup and shutdown of workstations such as the correct procedure to exit software.
- Adjust monitor controls for maximum comfort and usability.
- Recognize the availability of information services; e.g., electronic mail, bulletin boards, browser, gopher.

related academic: (c10, c11, c17, s11)

STANDARD 151302-02 **The student will be able to understanding physical and safety factors.**

OBJECTIVES

151302-0201 Demonstrate an understanding of ergonomic considerations.
- Position the screen, chair, keyboard, and lighting for comfort and to ensure good health and posture.

151302-0202 Demonstrate personal safety.
- Remove any electrical or mechanical hazards.

related academic: (c10, c11, c17, s11)\

STANDARD 151302-03 **The student will be able to understand and use the computer operating system.**

OBJECTIVES

151302-0301 Start and exit a software program as required.
- Gain access into CAD software with correct prior configuration.
- Use reference manuals, library materials, and textbooks.

151302-0302 Demonstrate proper file management techniques.

- Use the correct operating system to copy, delete, and rename files, and check disks.
- Make correct file backups.

151302-0303 Format floppy disks.
- Use the correct procedure to format 3.5" floppy disks.

151302-0304 Translate, import, and export data files using different formats.
- Use the correct procedure to import/export: txt, iges, dxf files.

151302-0305 Use online help.

151302-0306 Save drawings to the storage device.
- Use the correct technique in storing drawings to the hard drive and floppy drive.

related academic: (c10, c11, c17, s11)

STANDARD 151302-04 **The student will be able to understand and use basic CAD drafting skills.**

OBJECTIVES

151302-0401 Use correct media and related drafting materials.
- Use correct papers, vellum, mylar, plotter pens, toner, and cartridges.

151302-0402 Use and know correct geometric construction techniques; i.e., tangencies to arc, circles, lines, polygons, ellipses, lines to quadrants, parabolic, ogee curves, and spline curves.
- Use cartesian coordinates, absolute, polar, and relative to create drawings.

151302-0403 Use basic measuring systems.
- Use decimals, fractions, feet and inches, and metric engineering measurements.

151302-0404 Add correct annotation to drawings.
- Use correct lettering techniques and correct text sizes and styles.

151302-0405 Identify and use correct line styles and line widths on drawings.

151302-0406 Prepare title blocks for different drafting formats.

151302-0407 Apply metric and/or dual dimensions to drawing with ANSI Y14.5 standards.

151302-0408 Reproduce originals using different methods.
- Plot to scale and use correct plot specs.
- Plot drawings with correct line widths.
- Plot on different media, pens, plotters, and printers.

151302-0409 Create freehand technical sketches.

related academic: (c1, c7, c11, c04, m1, m4.2, m6, m7.1, m7.4, m8, m8.9, m01, s8)

STANDARD 151302-05 **The student will be able to create drawings using a CAD system.**

OBJECTIVES

151302-0501 Create new drawings.
- Create and place appropriate orthographic views.
- Create and place appropriate auxiliary views.
- Create and place appropriate section views.

- Identify and create axonometric drawings; i.e., isometric, dimetric, and trimetric.
- Identify and create oblique drawings; i.e., cabinet and cavalier

151302-0502 Perform a drawing setup.
- Use a setup for decimal inches, feet, engineer, and degree of precision.
- Make a setup for different-sized work areas and scale the drawing per software package.

151302-0503 Use and control accuracy enhancement tools.
- Use snap, x,y,z, entity, grid, and positioning methods.

151302-0504 Identify and use appropriate symbol libraries.
related academic: (c10, c11, c17, m1, m2, m4, m4.1, m4.4, m6, m7, m7.1, m8, m8.9, s2, s3, s8, s11)

STANDARD 151302-06 **The student will be able to edit drawings using a CAD system.**

OBJECTIVES

151302-0601 Utilize geometry editing/modify commands.
- Use trim, extend, fillet, scale, stretch, offset, rotate, mirror, pedit, and ddmodify.

151302-0602 Utilize non-geometry editing commands.
- Edit text, drawing format, and spelling.
- Use and change properties.

related academic: (m1, m8.9, s2, s3, s8, s11)

STANDARD 151302-07 **The student will be able to manipulate drawings using a CAD system.**

OBJECTIVES

151302-0701 Control coordinates and display scale.
- Move the origin to assist in drawing.
- Use control coordinates and display scale.

151302-0702 Control entity properties.
- Use line types, color, line, and widths.

151302-0703 Using viewing commands.
- Use dynamic, rotation, zooming, panning, and window.

151302-0704 Use standard parts and/or symbol libraries.
- Insert standard parts and symbols into the drawing.

151302-0705 Plot drawings on media using the correct layout and scale, line width, and legible text per ANSI Y14.5 standards.

151302-0706 Use layering techniques.

151302-0707 Use grouping techniques.

151302-0708 Minimize a drawing file.
related academic: (m1, m4, m6, m7.1, m8.9, m9, m10, s2, s3, s8, s8.9, s11)

STANDARD 151302-08 **The student will be able to analyze drawings using a CAD system.**

OBJECTIVES

151302-0801 Use query commands to interrogate the database.

- Use distance, list, status, area, dblist, time, entity characteristics, and save time.

related academic: (c11, m5.1, m5.2, m5.3, m5.4, m5.5, m7.1, s8, s11)

STANDARD 151302-09 **The student will be able to dimension drawings using a CAD system.**

OBJECTIVES

151302-0901 Apply dimensioning rules correctly and comply with ansi y14.5 standards.

- Avoid redundant dimensions.
- Avoid dimensioning to hidden lines.
- Place dimensions on most descriptive views.

151302-0902 Use correct dimension line terminators.

- Use arrowhead, slashes, and ticks when dimensioning.

151302-0903 Dimension objects.

- Place dimensions on view in compliance with ansi y14.5 standards.
- Dimension lines, angles, arcs, pyramids, and circular objects.

151302-0904 Dimension complex objects; e.g., spheres, cylinders, and tapers.

- Dimension features from center lines, lines of symmetry, theoretical points, and of intersection.
- Use appropriate dual dimensioning standards.
- Use correct size and location dimensions.
- Use correct dimension variable settings.
- Use cartesian, polar, and datum dimensions.
- Use ordinate dimensions; e.g., tabular and baseline dimensions.

related academic: (s2, s3, s8, s11)